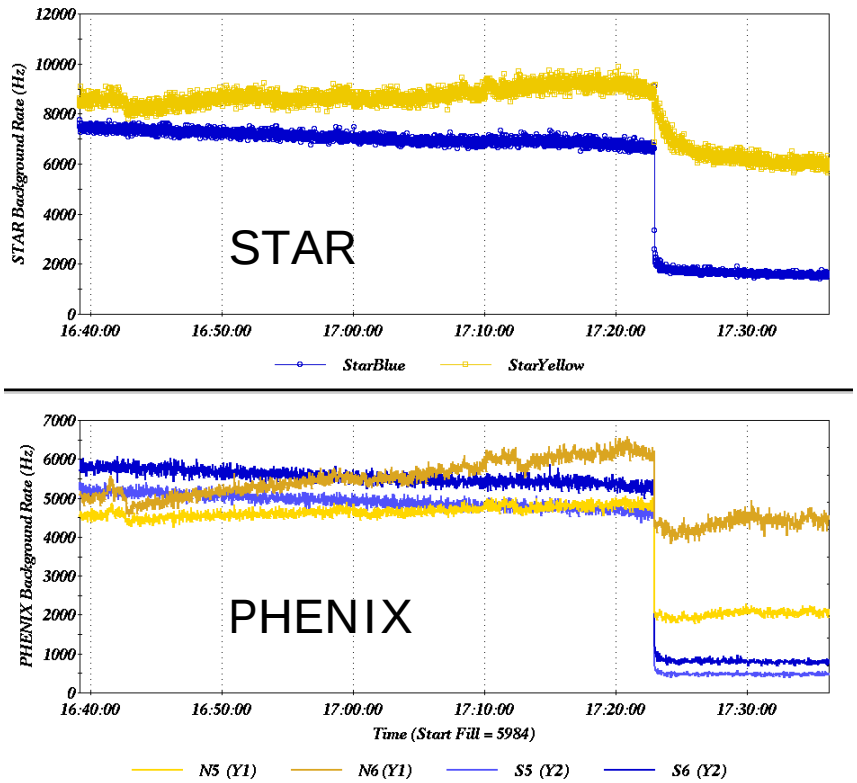
AP Experiments Liaison

- Background Signals
- CDEV, BERT
- ZDC
- Cross Sections
- Vertex

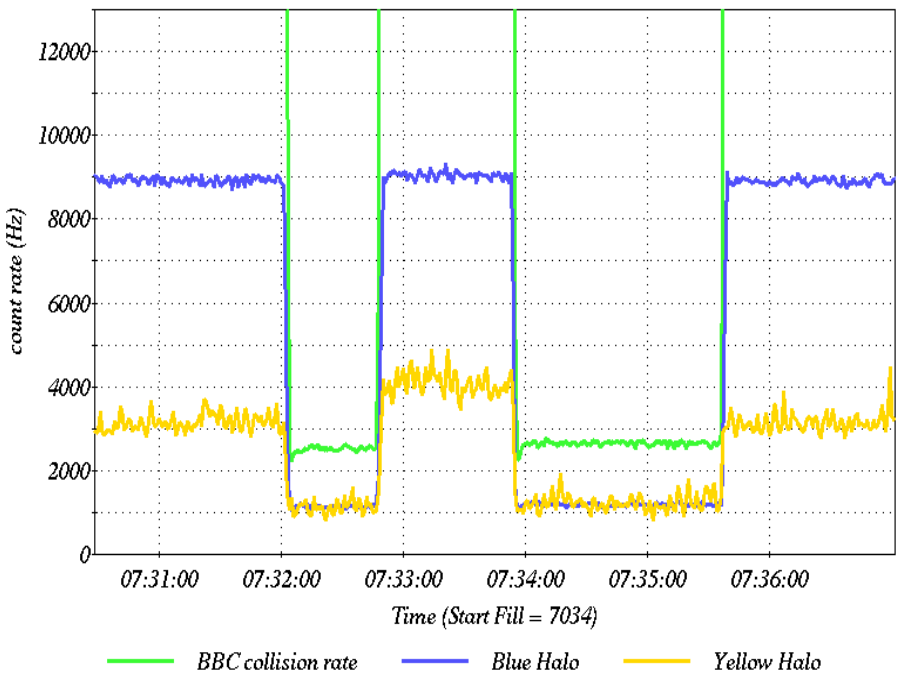
Background contamination with collision rates during Cu-run



- top: STAR blue halo and yellow halo signals, bottom: PHENIX scintillator signals (N5&6, S5&6)
- rates drop to less than 20% during an uncogging experiment in PHENIX and STAR blue halo (yellow halo?), N6 was somewhat different
- for the remainder of the run we successfully scaled the PHENIX backgrounds with the colllision rate to compensate for this:

  bkgd = bkgd-scalef x coll
- scalef = 0.17 to 0.28

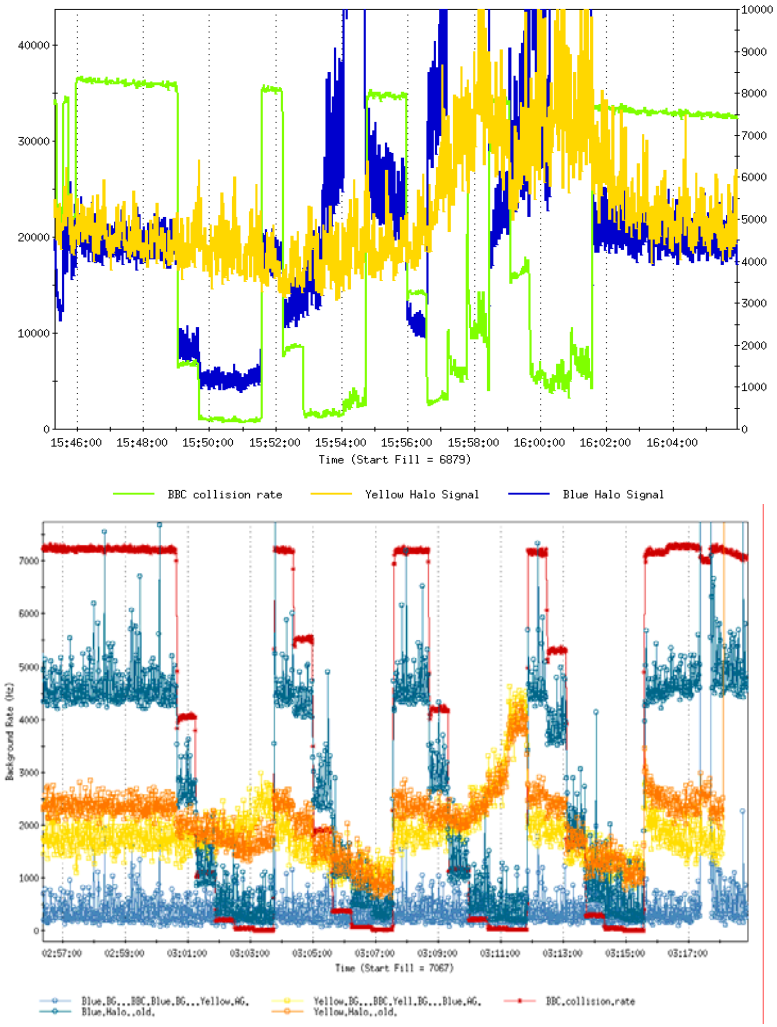
STAR pp background signal quality



- uncogging beams with fill patterns > 56 bunches leaves some remaining collisions
- blue and yellow backgrounds drop to almost zero
- amount of collimation contamination is very different in blue and yellow signal: 1/9 (blue) and about 1/3 (yellow)
- the blue background signal is dominated by collisions!

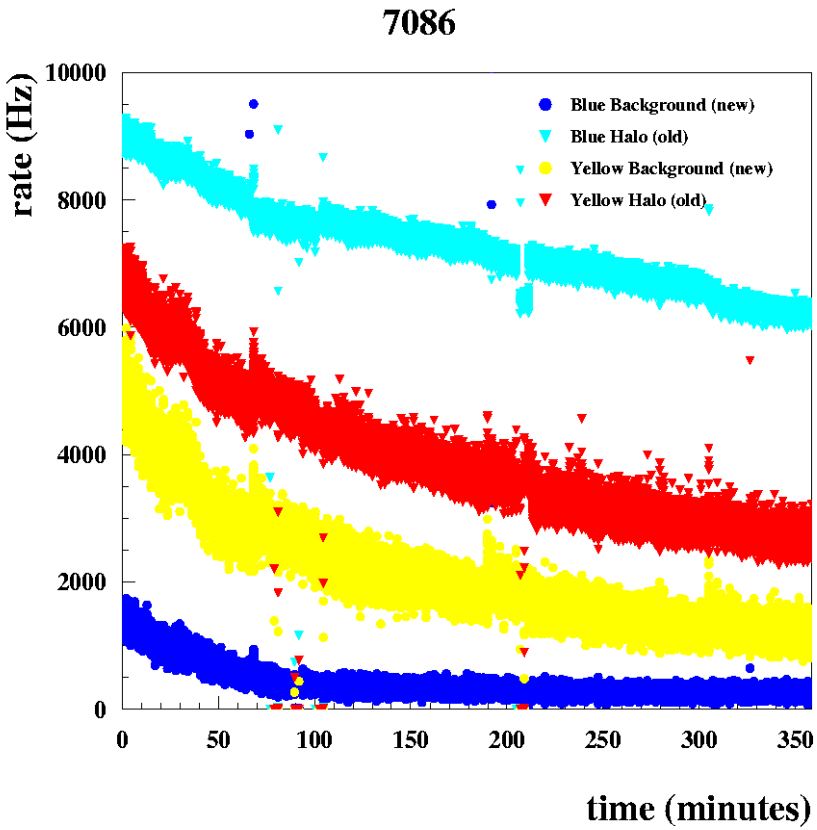
STAR Background Signals during transverse steering (vernier scan)

- uncogging experiment can be confirmed with transverse steering experiments (aka vernier scans ;))
- top: scan early in the pp run, bottom: scan later in the pp run
- while yellow even increases for very missteered beams, blue behaves almost like the collision rate (BBC, red).
- blue Halo does not give a good background measure! New blue background is clearly not contaminated by collisions

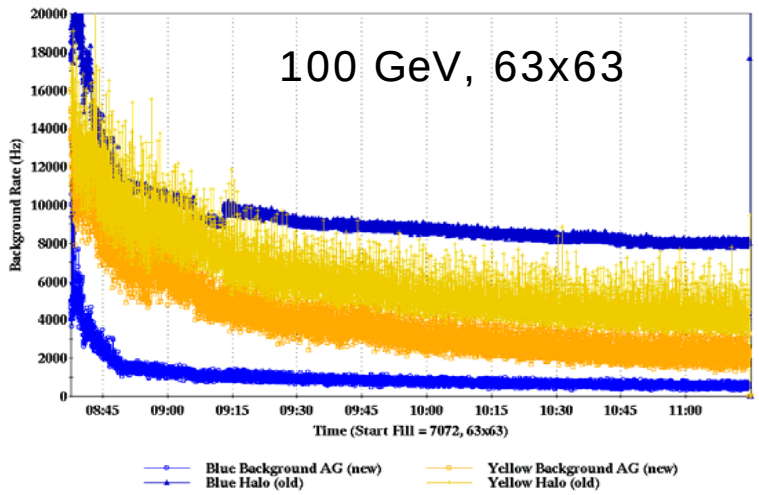


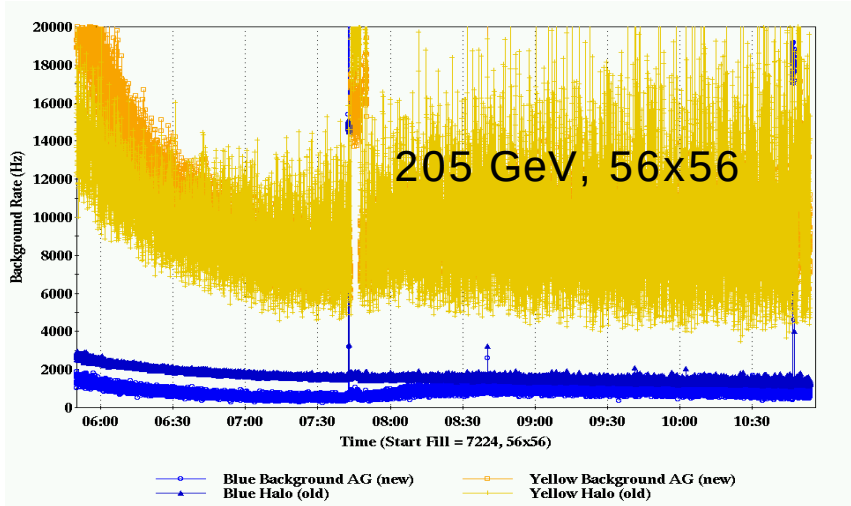
STAR backgrounds "new" vs. "old"

- good or bad conditions are based on the 'old' blue Halo and yellow Halo signals: BBC/(BH+YH) > 10.
- new signals are timed into the abort gap of the other ring and scaled to the total number of bunches
- both yellow signals are close but blue signals were very different, not clear what to do
- needs STAR expert to look into and to study



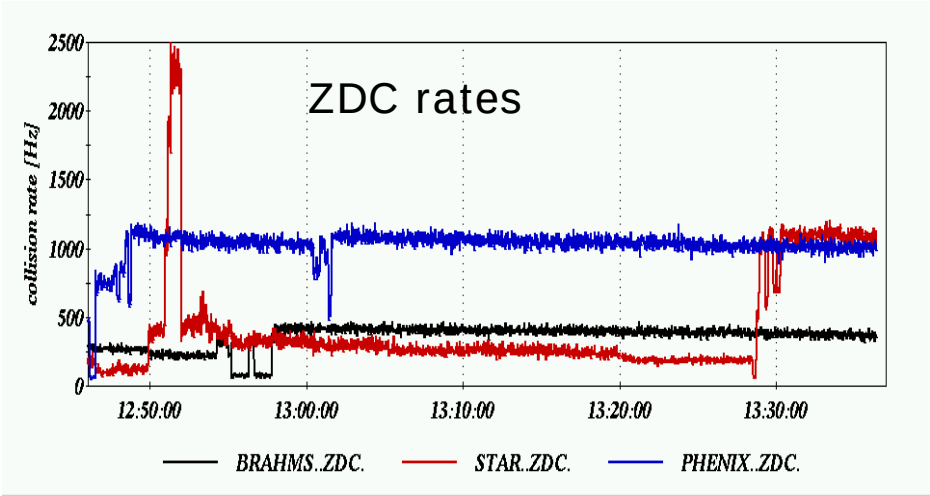
STAR backgrounds "new" vs. "old"

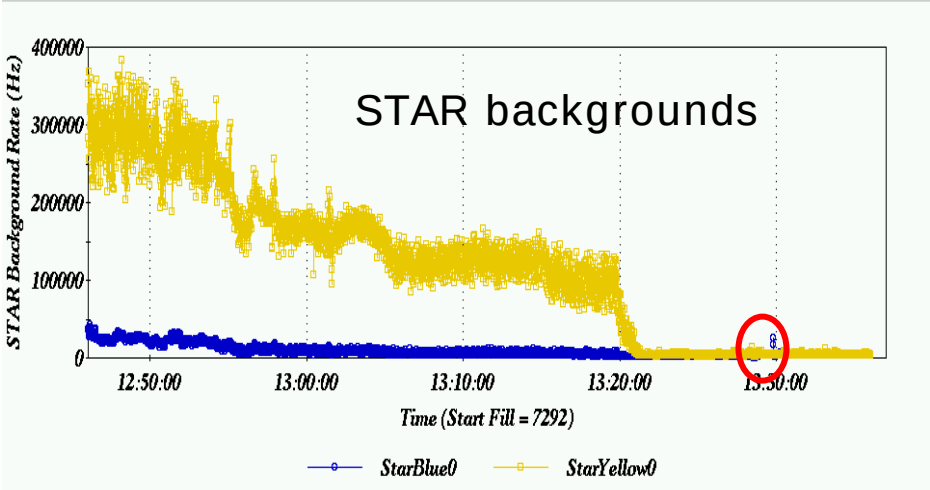




- left: store with 63x63 bunches, right: store with 56x56 bunches (205 GeV!)
- Yellow is more or less consistent in both cases, blue is clearly very different
- however, I've seen some 56x56 stores with larger differences in the two blue background signals than in the two 205 GeV stores.

Reliability of STAR backgrounds for steering and collimation





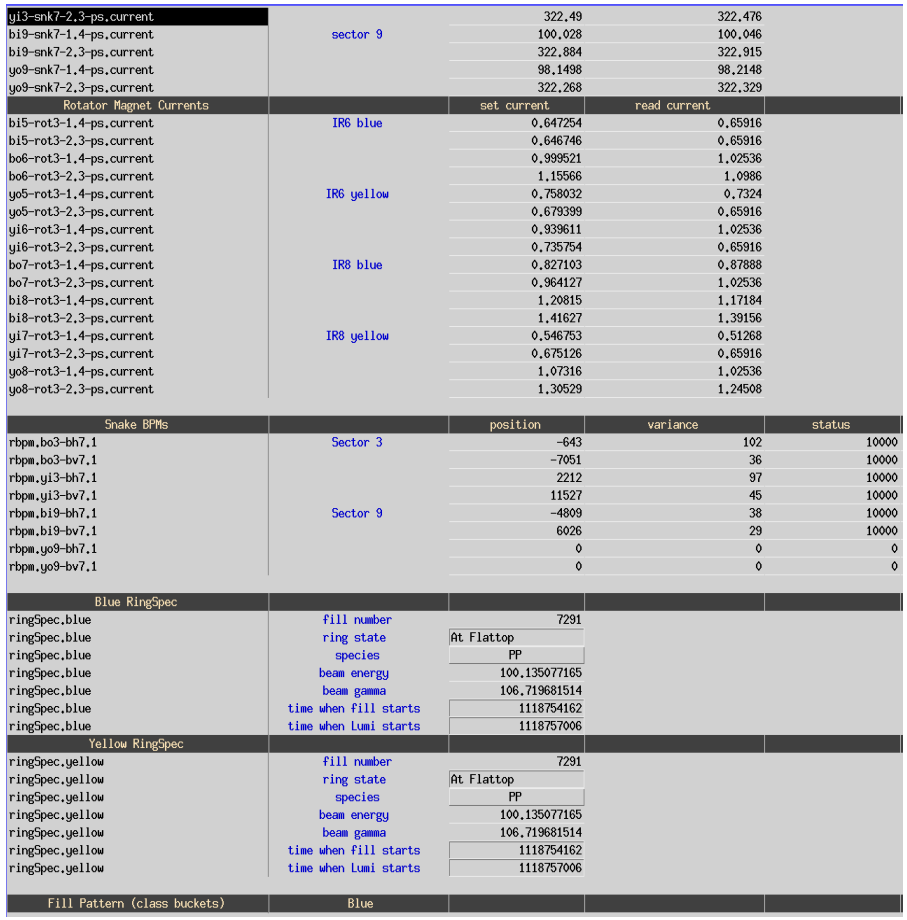
- top: ZDC collision rate from BRAHMS, PHENIX and STAR, STAR is not optimized
- when optimization is attempted (using yellow beam), ZDC rates are clearly overshooting the goal
- during that attempt there is no increase in the yellow background!
- could that be due to saturation? (I've seen even higher rates though)
- final optimization only possible after collimation (and blue beam was used => some spike during steering!)

Summary Backgrounds

- PHENIX scintillator backgrounds are reliable, useful and consistent for steering and collimation
- STAR backgrounds are varying and at times dominated by collision signals
- we lack support from some expert to study and understand those signals (fill pattern dependence?)
- collimation and background reduction at STAR is difficult (if not impossible) under those conditions
- there were no background issues with any of the other experiments (except, maybe, pressure rise caused backgrounds) due to large beta* values

CDEV: Getting data online to experiments

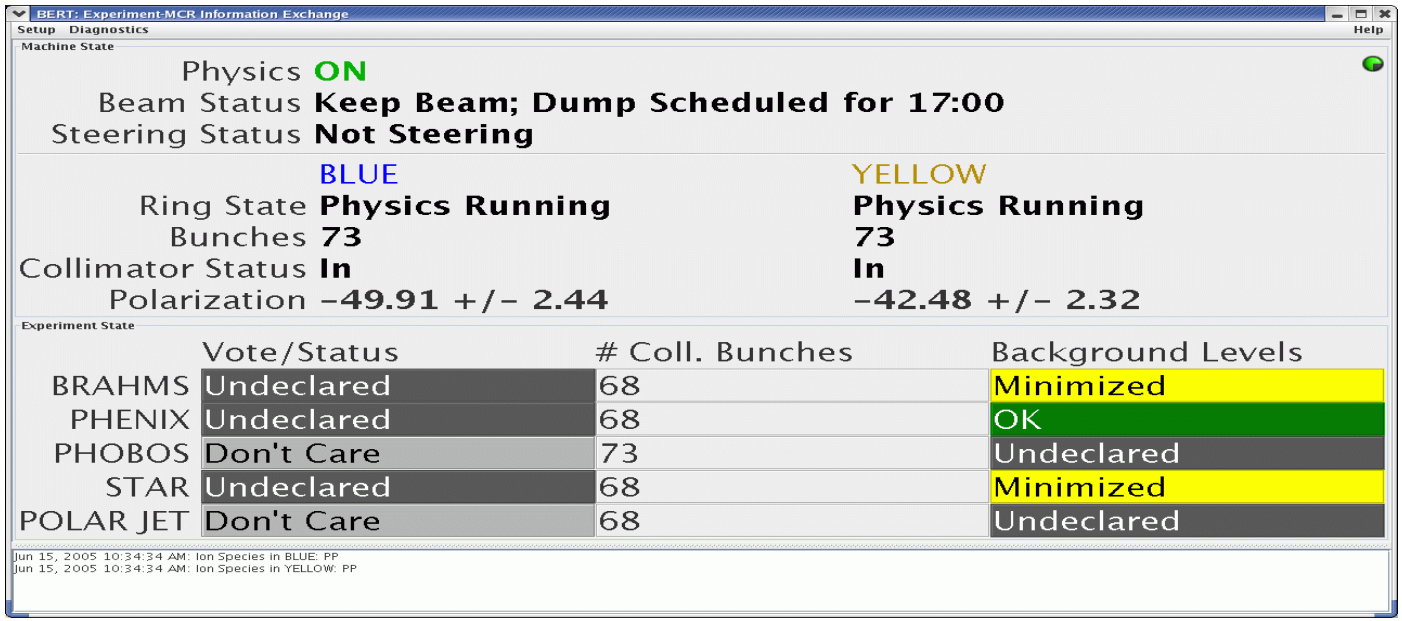
- list of CDEV parameters was cleaned up before the beginning of this run
- there are PET pages available to experiment experts to check on all CDEV devices & parameters online (common and individual)
- there were only minor issues with CDEV this year (correct me if I'm wrong!)



yi3-snk7-2,3-ps.current		322.49	322.476	
bi9-snk7-1.4-ps.current	sector 9	100.028	100.046	
bi9-snk7-2,3-ps.current		322.884	322.915	
yo9-snk7-1.4-ps.current		98.1498	98.2148	
yo9-snk7-2,3-ps.current		322.268	322.329	
Rotator Magnet Currents		set current	read current	
bi5-rot3-1.4-ps.current	IR6 blue	0.647254	0.65916	
bi5-rot3-2,3-ps.current		0.646746	0.65916	
bo6-rot3-1.4-ps.current		0.999521	1.02536	
bo6-rot3-2,3-ps.current		1.15566	1.0986	
yo5-rot3-1.4-ps.current	IR6 yellow	0.758032	0.7324	
yo5-rot3-2,3-ps.current		0.679399	0.65916	
yi6-rot3-1.4-ps.current		0.939611	1.02536	
yi6-rot3-2,3-ps.current		0.735754	0.65916	
bo7-rot3-1.4-ps.current	IR8 blue	0.827103	0.87888	
bo7-rot3-2,3-ps.current		0.964127	1.02536	
bi8-rot3-1.4-ps.current		1.20815	1.17184	
bi8-rot3-2,3-ps.current		1.41627	1.39156	
yi7-rot3-1.4-ps.current	IR8 yellow	0.546753	0.51268	
yi7-rot3-2,3-ps.current		0.675126	0.65916	
yo8-rot3-1.4-ps.current		1.07316	1.02536	
yo8-rot3-2,3-ps.current		1.30529	1.24508	
Snake BPMs		position	variance	status
rbpm.bo3-bh7.1	Sector 3	-643	102	10000
rbpm.bo3-bv7.1		-7051	36	10000
rbpm.yi3-bh7.1		2212	97	10000
rbpm.yi3-bv7.1		11527	45	10000
rbpm.bi9-bh7.1	Sector 9	-4809	38	10000
rbpm.bi9-bv7.1		6026	29	10000
rbpm.yo9-bh7.1		0	0	0
rbpm.yo9-bv7.1		0	0	0
Blue RingSpec				
ringSpec.blue	fill number	7291		
ringSpec.blue	ring state	At Flattop		
ringSpec.blue	species	PP		
ringSpec.blue	beam energy	100.135077165		
ringSpec.blue	beam gamma	106.719681514		
ringSpec.blue	time when fill starts	1118754162		
ringSpec.blue	time when Lumi starts	1118757006		
Yellow RingSpec				
ringSpec.yellow	fill number	7291		
ringSpec.yellow	ring state	At Flattop		
ringSpec.yellow	species	PP		
ringSpec.yellow	beam energy	100.135077165		
ringSpec.yellow	beam gamma	106.719681514		
ringSpec.yellow	time when fill starts	1118754162		
ringSpec.yellow	time when Lumi starts	1118757006		
Fill Pattern (class buckets)	Blue			

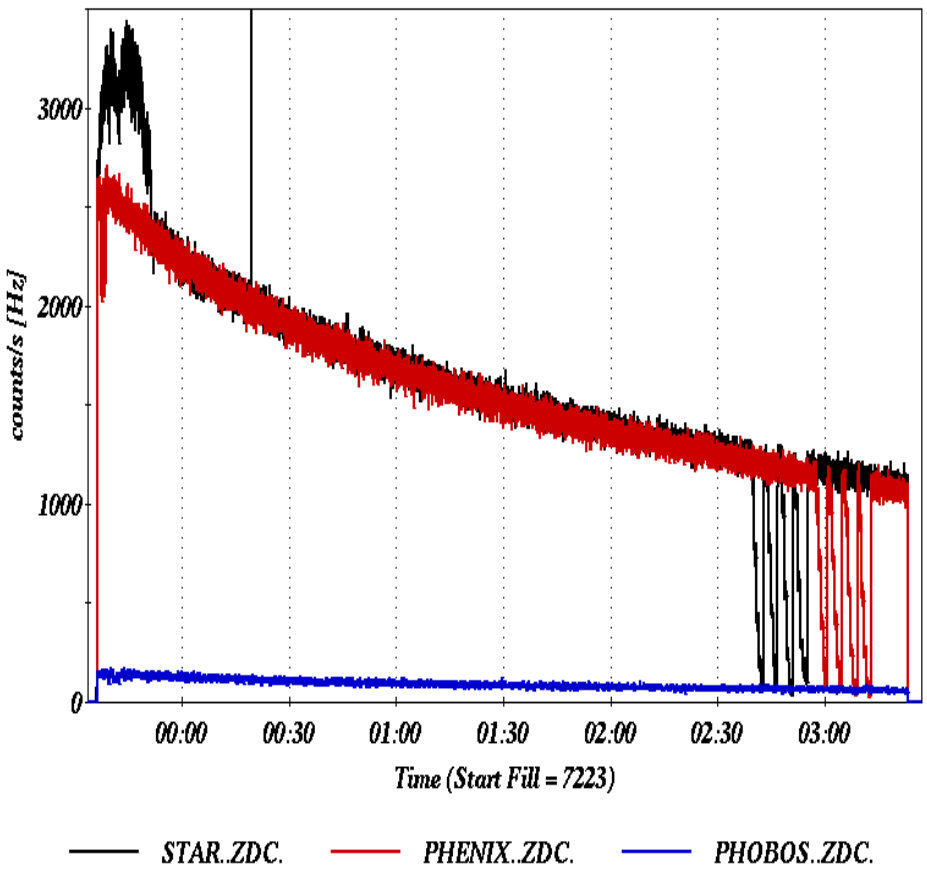
Online communications with Exp.

- BERT is routinely used by MCR and experiments
- phone contacts are still important and frequent though
- does this tool need improvements or changes? Let us know …



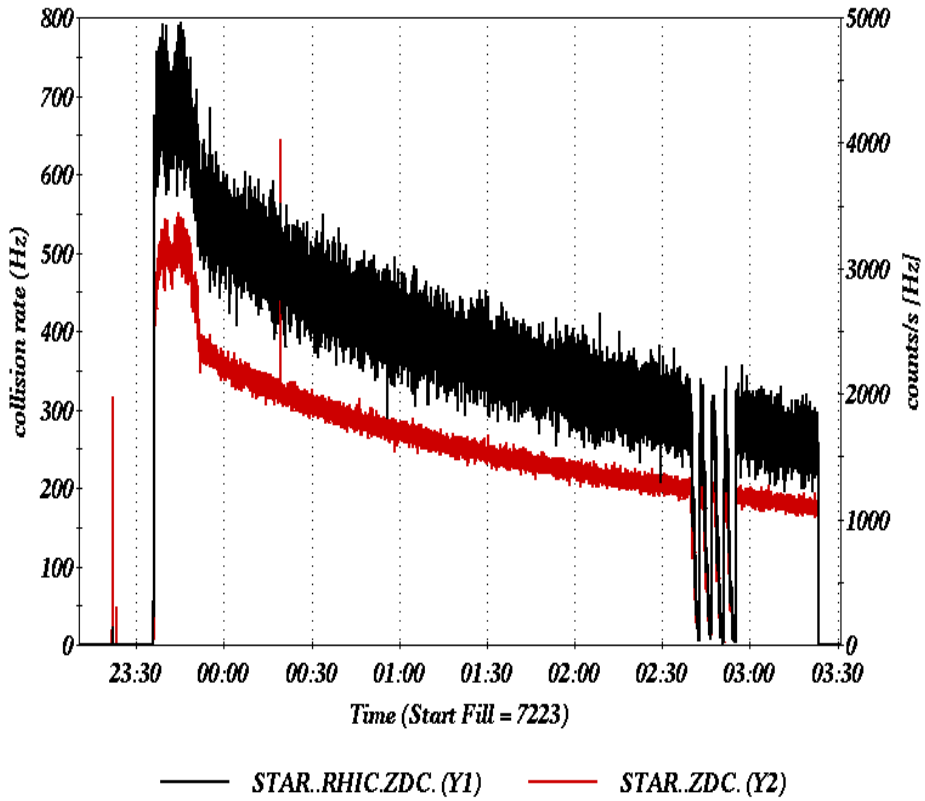
ZDC collision rates

- steering, optimization (even collimation) and bookkeeping is based on the ZDC collision rate
- we check the goal by the ratio of the various experiments according to their beta* values
- during the 205 GeV run ZDC rates clearly do not scale with beta* (10/2)!
- unclear why, are STAR & PHENIX too high? PHOBOS to low?
- need input from all experiments to find out: difficult to get
- ZDC readout should be a C-AD system, HV or thresholds change with energy and species



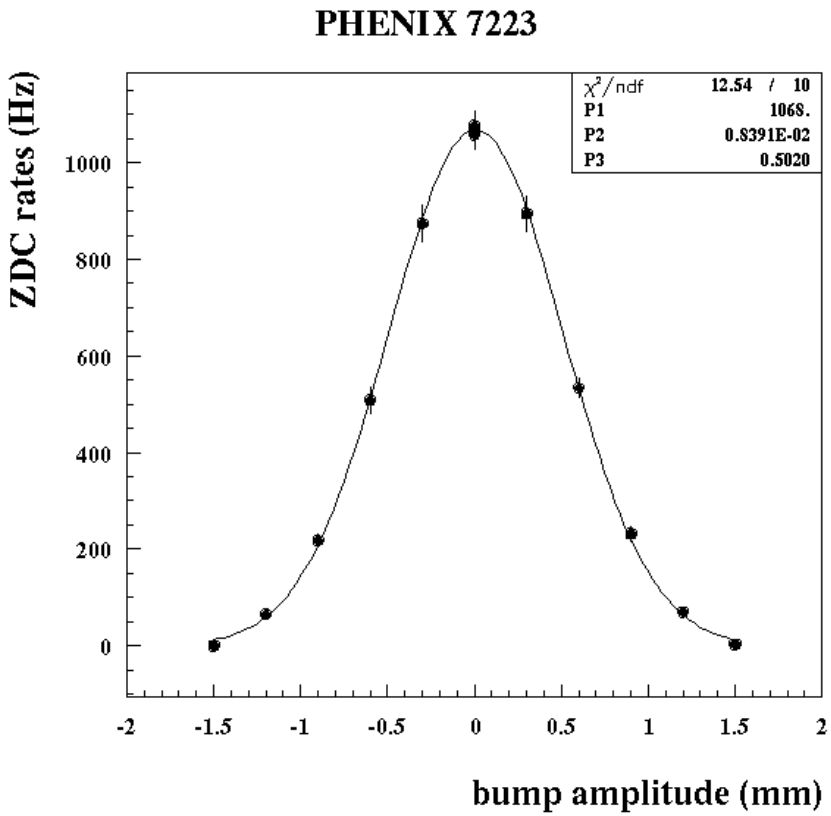
ZDC readout as C-AD device

- a C-AD copy of the existing readout electronics is already in place since the beginning of the Cu run
- we have no way (yet) to determine the right threshold => work in progress (see T. Russo talk tomorrow)
- signal evolution is consistent with collision signal ☺
- signal is smaller and noisier than experimenter signal (not understood yet) ☹
- we are working on timing with the beam synchronous clock for background reduction



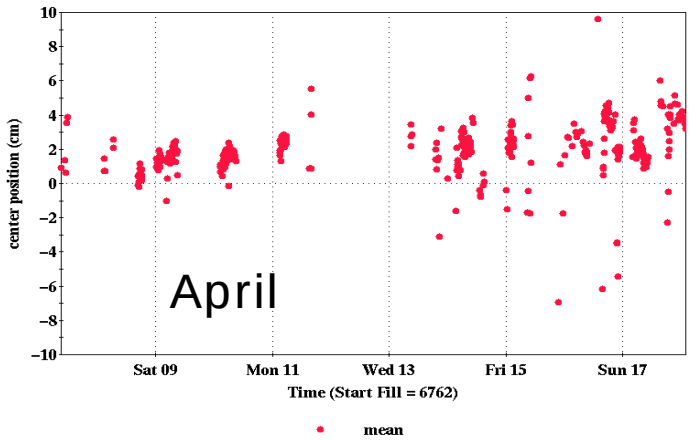
Cross Section Measurements

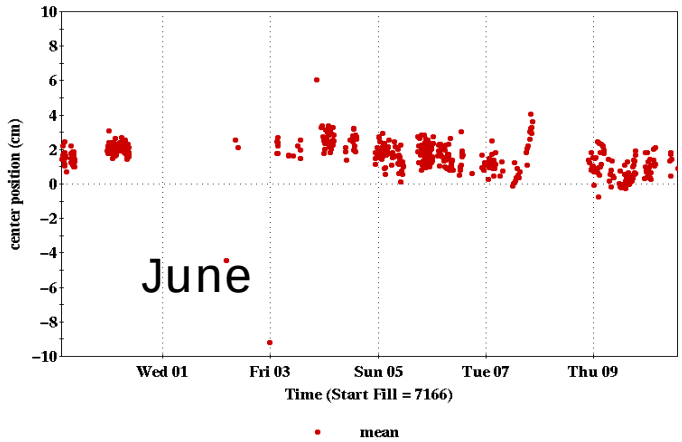
- cross section measurements needed for bookkeeping (and experimental purposes)
- measured by (more or less) regular vernier scans
- cross section measurement at 205 GeV yields about factor 4 higher than 100 GeV: approx. 1.6 mb (vs. 0.39 mb), not yet understood (work in progress with PHENIX)
- pp cross section in ZDCs changed from 0.33 mb to 0.39 mb this year, not understood
- open issue from pp 2004 of decreasing measured luminosity with increase of delivered luminosity, so far no input from experiments (B. Surrow?)



horizontal scan @ 205 GeV

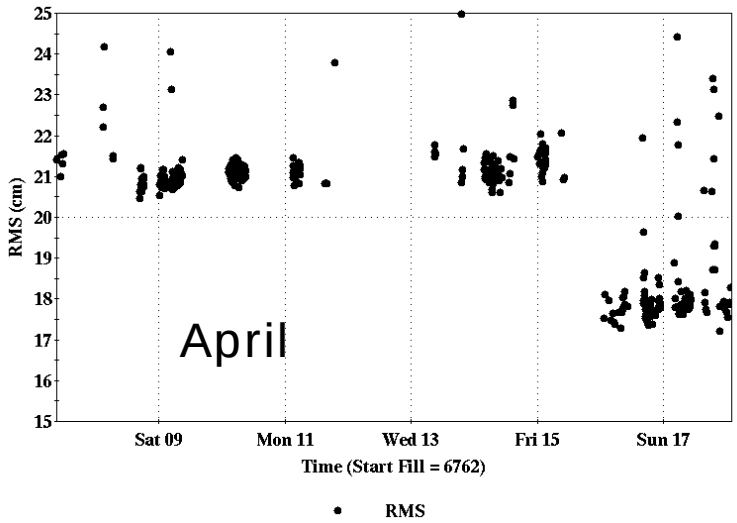
Mean Vertex Evolution

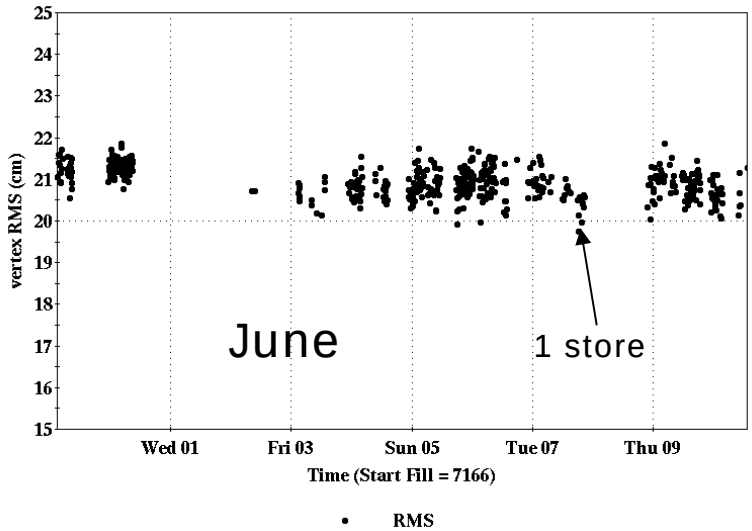




- top: early April, bottom: Jun 01-09
- we requested online z-vertex information from all experiments before the run
- we got at some point z- and x,y-vertex from PHOBOS, z vertex from PHENIX, no data from STAR and BRAHMS

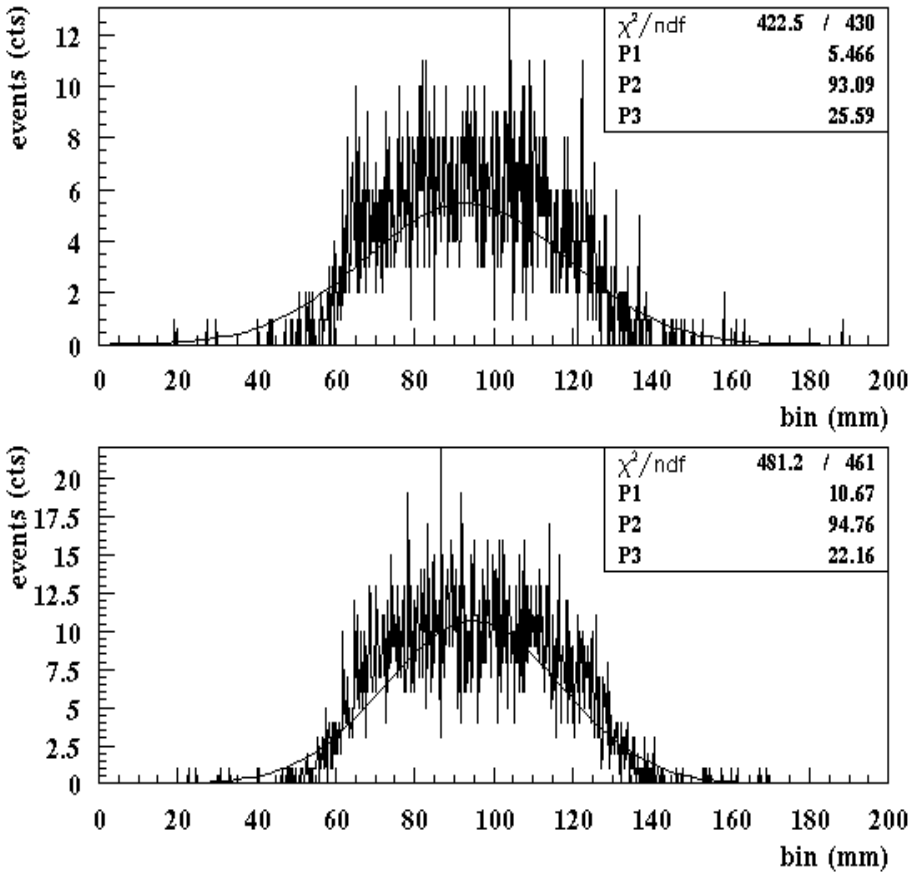
Z-vertex RMS variations





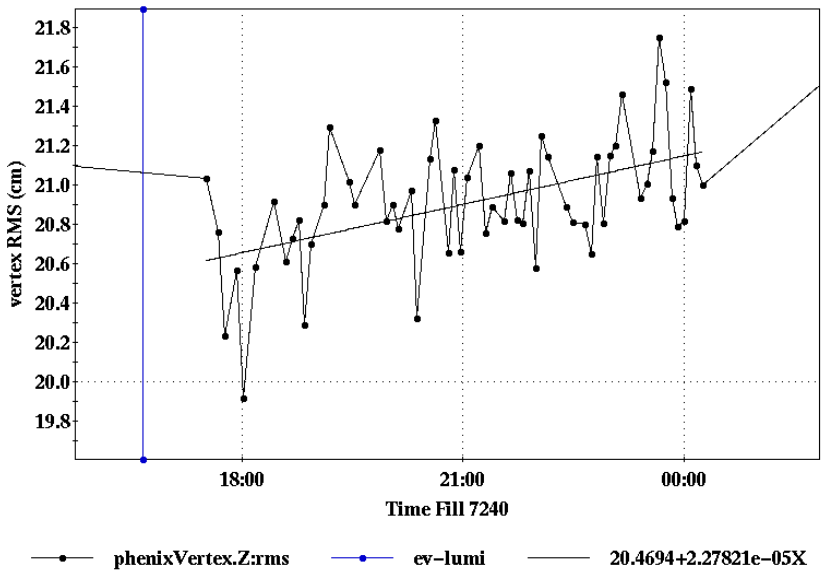
- same time periods as before (data from PHENIX)
- larger variations early in the run than later
- RMS values (from PHENIX online fits!) are typically around 21 cm

Z-vertex histograms



- 'raw' data from vertex distributions are available from PHOBOS and PHENIX
- top: 1st vertex in store, bottom: last vertex in store
- fits do not give the exact same results as PHENIX online fits, varies by up to 20% => need to talk to someone
- vertex distribution is constant to 1st order

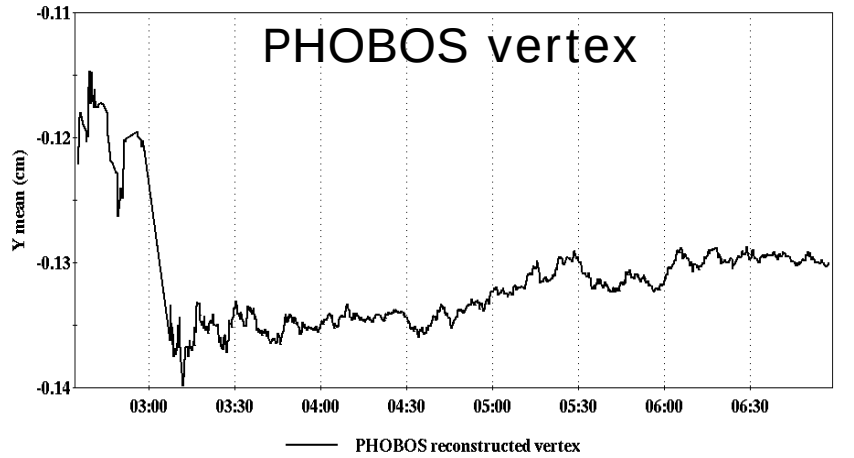
zoom into one store

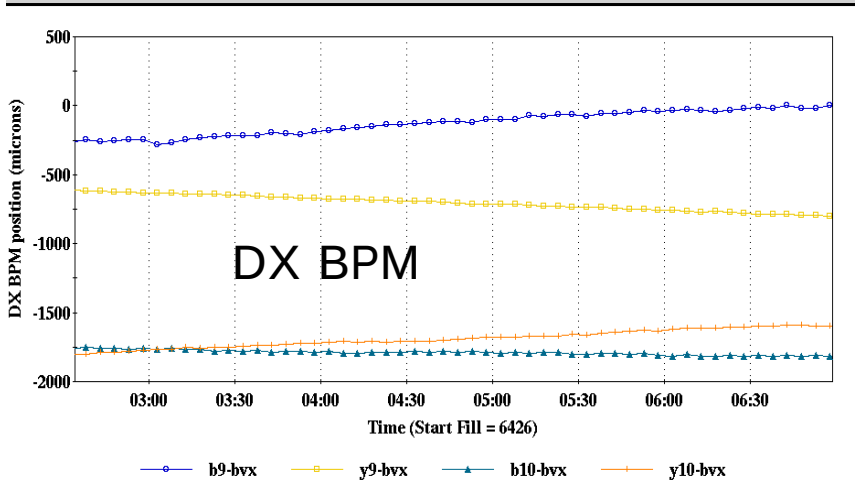


- though the RMS width is relatively stable there is some slight increase during the store
- increase rate is about 1mm/hour (not significant)
- data is from PHENIX online fits

Transverse vertex @ store

- PHOBOS delivered transverse vertex distributions
- so far we looked into PHOBOS online fit data only
- top: vertical vertex position from PHOBOS, bottom: BPM readings
- from vertex: -1.35 mm
- from BPM: -0.97 mm (blue) and -1.15 mm (yel)
- consistent within 0.4 mm (!) (similar in horizontal plane and other stores) ☺
- unfortunately, PHOBOS is the only one to deliver this data and here the DX BPMs are the most consistent with each other!





Summary

- Backgrounds with PHENIX: no issues
- Backgrounds with STAR: confusing, lacks support
- CDEV: no issues this year (?)
- ZDCs: HV and/or thresholds keep being an issue, transformation into C-AD system in progress -> how to change thresholds?
- Cross sections: needed for bookkeeping, open issues from pp_04
- collaboration on Xsec with PHENIX is going on ☺
- no collaboration with STAR established (yet?)
- vertex data from experiments:
  - no response from BRAHMS ☹
  - z-vertex data from PHENIX ☺
  - x,y,z vertex data from PHOBOS during Cu run ☺
  - no data from STAR (though x,y,z were promised) ☹